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INCREASED PROPORTIONS OF SENSED PRESENCES AND OCCIPITAL SPIKES WITH 1- AND 10-MSEC. POINT DURATION OF CONTINUOUS 7-Hz TRANSCEREBRAL MAGNETIC FIELDS[1]

J. N. BOOTH, S. A. KOREN, AND M. A. PERSINGER

Laurentian University

Summary.—To test the hypothesis that the numbers of "sensed presences" induced by the application of weak (1 microTesla) magnetic fields over the right hemisphere was subject to an optimal time of presentation, digital-to-analogue computer generated 7-Hz sine-waves were applied with point ("pixel") durations of 1, 3, 5, 7, 10, or 20 msec. for 5 min. each in a sequential counterbalanced order for six subjects. The proportion of numbers of sensed presences reported along the subjects' left sides and the proportions of electroencephalographic spikes over the occipital regions were greatest when 1- or 10-msec. point durations were employed. These results indicate that the specific duration of each successive field strength composing a complex sequence should be considered when designing optimal configurations for intercalating with neurocognition.

The sensed presence, the feeling of a proximal sentient being, can be reliably evoked by applying weak (1 microTesla) magnetic fields with asymmetric shapes over the right parietotemporal regions. These fields (Persinger, 2003) were generated by converting a series of numbers between 0 and 255 to incremental voltages for discrete amounts of time.

Dimensional analysis with the units for capacitance and resistance can be solved for seconds. If, for example, we assumed the bulk resistance of the human brain is about 1 kilo-ohms and the capacitance is about 1 microfarad, the resulting time (in seconds) wherein the forces associated with charge accumulation and movement are optimal would be 1 msec. We predicted optimal point durations are required for the elicitation of the sensed presence.

To test this hypothesis, we generated six different columns of numbers whose point durations would produce 7-Hz sine-waves when generated through special software if the duration of each point was either 1 msec., 3 msec., 5 msec., 7 msec., 10 msec., or 20 msec., respectively. 7.0 Hz was chosen given its prevalence within the earth-ionospheric cavity (Schumann resonance) and the hippocampal formation of the human brain. The changes in intensity associated with these different durations were standardized to 1 microTesla by adjusting the amplifier function within the software.

Three men and three women, who volunteered as participants for 1% bonus mark in a first-year course in psychology, were subjects. Each subject

[1]Please send correspondence to Dr. M. A. Persinger, Behavioral Neuroscience Laboratory, Laurentian University, Sudbury, ON Canada P3E 2C6.

received the six different point durations of the 7-Hz sine-waves presented through solenoids attached to a special helmet (Persinger, 2003) for 5 min. in a different order such that the order of each duration was balanced across the six subjects. The subject did not know when or for how long the specific fields would be presented. Each subject sat blindfolded in a comfortable chair within an acoustic chamber (Persinger, 2003).

The subjects were instructed to slightly move the left or right index finger (attached to electrodes) whenever they felt the presence of a sentient being to their left or right, respectively. If this presence was behind them, they were instructed to move both fingers. The second and third channels of the Grass Instrument P79 instrument recorded the subject's left or right finger movements by which was indicated the experience of a presence. Concurrent electroencephalographic activity over the occipital (O1, O2) regions on the remaining channel allowed monitoring of the subject's consciousness.

The proportions of left-side and right-side responses were calculated for each point duration by dividing these values by the total numbers of left- or right-side responses for all six durations for each subject. The means and *SEM* for the percentages of left-side responses for the 1-, 3-, 5-, 7-, 10-, and 20-msec. point durations were 23 (*SEM*: 4), 9 (*SEM*: 3), 15 (*SEM*: 5), 13 (*SEM*: 4), 28 (*SEM*: 9), and 12 (*SEM*: 3), respectively. Paired t tests indicated there were more sensed presences on the left side during the 1-msec. durations than the 3-msec. ($t_5 = 4.41$, $p < .01$) and 20-msec. ($t = 2.70$, $p < .05$) intervals. The *M* and *SEM* for the percentages of right-side responses were 10 (*SEM*: 4), 8 (*SEM*: 5), 10 (*SEM*: 5), 12 (*SEM*: 5), 15 (*SEM*: 8), 8 (*SEM*: 4), respectively, with no statistically significant differences.

The numbers of occipital (EEG) spikes, defined as sharp transients whose peak-to-peak amplitude was more than three times the values of the background variations were counted for the periods for each of the 6-point durations for each subject. Within-subject proportions of spikes were calculated. The *M* and *SEM*s for the six durations were 21 (*SEM*: 4), 12 (*SEM*: 4), 10 (*SEM*: 4), 6 (*SEM*: 3), 31 (*SEM*: 9), and 19 (*SEM*: 4), respectively. *Post hoc* paired t tests indicated there were proportionally more spikes during the 1- and 10-msec. point durations than the 7-msec. point duration ($t_5 = 3.30$ and 4.50, respectively, $ps < .01$). The proportions of left-side ($r = .80$) but not right-side ($r = .34$) presences was significantly ($p < .05$) correlated with the proportions of occipital EEG spikes. These results indicated that, at least for symmetrical 7-Hz fields, more frequent sensed presences might occur when a given field value is maintained for either 1 or 10 msec.

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